

# **Exhibit A**

## **Part 2 of 5**



DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 quantities of liquids?

2 A. Well, I guess I'm a little  
3 bit confused. I think unproven is  
4 different from proved to be wrong,  
5 right?

6 That is, there still could  
7 be -- at the end of the day there  
8 could still be no specific  
9 information saying that there were  
10 free liquids in the degreaser sludge.

11 But unless there is  
12 specific information saying that the  
13 sludges taken from the degreasers at  
14 the Handy & Harman facility were 100  
15 percent solid, then my opinion would  
16 still be that those degreaser sludges  
17 contain free liquids.

18 Q. And that opinion is based  
19 upon what?

20 A. As I said before --

21 MR. HARRIS: Again, I  
22 object, asked and answered.

23 Go ahead.

24 THE WITNESS: That opinion



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 is based on my knowledge of how  
2 trichloroethylene degreasers worked,  
3 how TCE has become to be one of the  
4 more predominant environmental  
5 contaminants, and the physical  
6 chemical properties of  
7 trichloroethylene.

8 BY MS. FLAX:

9 Q. So if I understand you,  
10 it's your position that only if  
11 evidence is proven to demonstrate the  
12 absence of free liquid your opinion  
13 would stay the same?

14 A. Correct.

15 Q. Continuing in that  
16 paragraph at the bottom of Page 7 of  
17 Vandeven-5, the sentence that starts  
18 "In addition, if the volume of  
19 degreaser sludge," do you see that  
20 sentence?

21 A. Yes.

22 Q. If that assumption was  
23 disproved or proved to be false,  
24 would you still hold the opinion that



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1 is contained in that sentence?

2 A. Are you asking if it's  
3 proven that the volume of degreaser  
4 sludge was not small but was large?

5 I guess I would -- if it  
6 was large and large enough to fill an  
7 entire -- to always fill up the drums  
8 that they were in, then there  
9 wouldn't be any place for liquid  
10 waste, other liquid waste.

11 Q. So then you would not make  
12 that statement. Correct?

13 A. I would not make that  
14 statement if there was evidence that  
15 every drum that had trichloroethylene  
16 degreaser sludge contained 48  
17 gallons, which is how big a 55-gallon  
18 drum is.

19 If each drum contained 48  
20 gallons of TCE degreaser sludge, I  
21 would not make that statement,  
22 correct.

23 Q. But you would make the  
24 statement with anything less than 48



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1 gallons?

2 A. Correct.

3 Q. Earlier I asked you about  
4 documents that Dr. Exner considered,  
5 some of which I believe you said you  
6 reviewed. Is that correct?

7 A. That's correct, yes.

8 Q. Did you have an opportunity  
9 to review either in whole or in part  
10 the deposition testimony of Thomas  
11 Curran?

12 A. Did he author an expert  
13 report?

14 Q. No. He's an individual.  
15 He's not an expert in this case.

16 A. Okay. I'm not sure if I  
17 did or not.

18 Q. I'm handing you the  
19 transcript of the deposition of  
20 Thomas Curran. And what I would like  
21 to do is I would like to have you  
22 read from page 53, line 20 to Page  
23 55, line 14.

24 MS. FLAX: Do you want to



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1 look at my copy while he's reading  
2 that?

3 THE WITNESS: 53 20 to 55  
4 14?

5 BY MS. FLAX:

6 Q. Please. And when you are  
7 done, please tell me.

8 MR. HARRIS: If he wants  
9 to, can he look at any other lines?

10 MS. FLAX: What?

11 MR. HARRIS: If he wants  
12 to, can he look at any other lines?

13 MS. FLAX: If he wants to.

14 MR. HARRIS: Well, when you  
15 instructed him to read those lines, I  
16 wanted him to know if he looks at  
17 other lines, it's okay.

18 BY MS. FLAX:

19 Q. Well, my questions are  
20 going to be directed to Mr. Vandeven  
21 with respect to the page and lines I  
22 just gave you. But if you feel you  
23 need to review before and after, by  
24 all means do so.



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1 A. Okay.

2 Q. You have had an opportunity  
3 to read Page 53, line 20 through Page  
4 55, line 14 of the deposition of  
5 Mr. Curran. Is that correct?

6 A. Yes.

7 Q. I am going to represent to  
8 you that Mr. Curran was an employee  
9 of Handy & Harman Tube Company, just  
10 so that you know that when I ask you  
11 about Handy & Harman's industrial  
12 wastes that's why I'm asking you,  
13 because you have now read testimony  
14 from Mr. Curran. Okay?

15 A. Okay.

16 Q. Is there anything in  
17 Mr. Curran's testimony that suggests  
18 that the industrial waste solution  
19 that he describes contains any  
20 hazardous material?

21 MR. HARRIS: Hold on a  
22 second. He's not being offered as an  
23 expert -- he's not here to give an  
24 opinion as to what was in Handy &



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1 Harman's waste, so that's not a  
2 proper question.

3 MS. FLAX: Are you  
4 directing him not to answer?

5 MR. HARRIS: I might. I'm  
6 trying to figure out where you are  
7 going with this. He is not going to  
8 offer an opinion in this case as to  
9 what was in Handy & Harman's waste.  
10 That is not in his report. He's not  
11 here to form new opinions.

12 If you are about to ask him  
13 to give an opinion as to what was in  
14 Handy & Harman's waste, then that's  
15 an improper question.

16 MR. PETTIT: Glenn, can I  
17 just say something, because --

18 MR. HARRIS: Yes. I'm not  
19 trying to be --

20 MR. PETTIT: You ought to  
21 clarify this, because as Melissa  
22 pointed out in her questioning, in  
23 rebuttal opinion he adopts  
24 Dr. Exner's descriptions of the



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 wastes associated with various  
2 industries and defendants.

3 MR. HARRIS: But he  
4 clarified -- well, go ahead and  
5 finish.

6 MR. PETTIT: I'm trying to  
7 understand the scope of his opinion.

8 MR. HARRIS: I would like  
9 to make this simple. He is not going  
10 to be a second Dr. Exner rendering  
11 all the opinions Dr. Exner presented.

12 He looked at that, as he  
13 testified earlier, solely for the  
14 purpose of understanding better and  
15 in more detail basically some of the  
16 acid wastes that were associated with  
17 some of the companies in this case.

18 That was the intent of that  
19 sentence or two in his rebuttal  
20 opinion. We will not put him on the  
21 stand and ask him to testify other  
22 than what's in his report.

23 MS. FLAX: Or in his  
24 rebuttal report.



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1 MR. HARRIS: Or in his  
2 rebuttal report, specifically.  
3 Unless he specifically says something  
4 about a particular waste, we are not  
5 going to put him on and be -- you  
6 know, say everything the experts say.

7 MR. COOLEY: I'm not sure I  
8 understood the last sentence. Unless  
9 he says something specific about --

10 MR. HARRIS: Well, for  
11 example, he made some comments  
12 specifically about the degreaser  
13 sludge. Certainly that's in his  
14 report, certainly he is going to  
15 testify to it.

16 He's made some comments  
17 generally in one report or the other,  
18 frankly I don't remember which, about  
19 plating wastes or printed circuit  
20 board wastes. He is going to say  
21 whatever is in his report about that.

22 But he is not going to come  
23 up with some wholesale opinion about  
24 what was in any particular



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 defendant's waste.

2 In his report here I think  
3 Handy & Harman's is the only  
4 defendant's waste stream he actually  
5 refers to at all by defendant.  
6 That's not going to change.

7 MS. FLAX: So if you are  
8 representing that other than what's  
9 contained in Vandeven-1 and  
10 Vandeven-5 that Mr. Vandeven will not  
11 be at any time offering an opinion as  
12 to a party's specific waste stream,  
13 with the exception of obviously the  
14 Handy & Harman TCE degreaser sludge,  
15 then I will withdraw the question.

16 MR. HARRIS: Yes. That's  
17 what I'm representing.

18 MR. COOLEY: May I clarify  
19 one other thing? I'm not trying to  
20 split hairs --

21 MR. HARRIS: No, no. I  
22 want to get to the bottom of it so we  
23 don't waste a lot of time.

24 MR. COOLEY: In the section



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1 of I believe it's Vandeven-1 in which  
2 there are a series of bullets with  
3 statements about types of wastes from  
4 certain industries, let's say, do I  
5 understand correctly that he is not,  
6 in that portion of his report,  
7 stating an opinion or a conclusion  
8 that the descriptions of waste there  
9 apply to any of the defendants in  
10 this case?

11 MR. HARRIS: Any specific  
12 defendant?

13 MR. COOLEY: Correct.

14 MR. HARRIS: That's  
15 correct. He is not saying that.  
16 That's why, just to keep going down  
17 the road, that's why he doesn't say  
18 anywhere in his report either that  
19 any particular waste got to the site.

20 He is simply saying, look,  
21 here is what is generally in pickle  
22 liquor, not Carpenter's pickle  
23 liquor, not specifically NRM's pickle  
24 liquor, not Peckel Waste (phonetic)



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1 pickle liquor, here is generically  
2 what's in pickle liquors, and it's  
3 generally this kind of stuff.

4 And if you dumped it on the  
5 ground at the site, here is what it  
6 would be, without representing any  
7 particular defendant, without  
8 rendering an opinion that any  
9 particular defendant's waste has X  
10 percent of hydrochloric acid versus,  
11 you know, whatever.

12 Is that helpful? I mean,  
13 I'm not barring you from asking him  
14 questions. Melissa, maybe we can  
15 take it one at a time.

16 Yes. He will not say  
17 anything about what is in Handy &  
18 Harman's industrial waste solution,  
19 other than what he already says here  
20 about the sludge.

21 MS. FLAX: Okay. Then I  
22 will withdraw my last question  
23 relating to Mr. Curran.

24 (Discussion off the



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 record.)

2 MS. FLAX: I am not asking,  
3 Glenn, for him to give an opinion.

4 I was asking whether  
5 reviewing Mr. Curran's testimony  
6 regarding the industrial waste  
7 solution that was generated at the  
8 Handy & Harman facility whether based  
9 upon that description he considered  
10 that waste to be a hazardous waste.

11 MR. HARRIS: I don't think  
12 he had an opinion as to that waste.  
13 That's my point.

14 MS. FLAX: And he is not  
15 going to offer an opinion as to --

16 MR. HARRIS: Other than  
17 what he says about the TCE sludge.

18 MS. FLAX: Other than the  
19 degreaser sludge?

20 MR. HARRIS: Sure. He is  
21 not going to take the stand and say  
22 it is my opinion that X, Y and Z is  
23 in Handy & Harman's industrial waste  
24 sludge.



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 BY MS. FLAX:

2 Q. Do you have a degree in  
3 metallurgy?

4 A. No, I don't.

5 Q. Did you take any courses in  
6 the field of metallurgy?

7 A. As part of my master's  
8 degree, yes.

9 Q. And what kinds of courses  
10 were those?

11 A. They were material science  
12 courses that included metallurgical  
13 sciences.

14 Q. And since those courses  
15 that you took in 19 -- in or about  
16 '85 --

17 A. That's correct.

18 Q. -- have you taken any  
19 other courses or had any other  
20 studies in the field of metallurgy?

21 A. No.

22 Q. Other than the degreaser  
23 sludge, you have not formed any  
24 opinions as to the composition,



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 nature or characteristics of wastes  
2 generated by Handy & Harman Tube  
3 Company or the Handy & Harman  
4 facility. Correct?

5 A. That's correct.

6 Q. This morning, Mr. Vandeven,  
7 I had started to ask you about  
8 marked-up versions of drafts of  
9 Exner-1.

10 And we came to the --  
11 Vandeven-1, excuse me -- and we came  
12 to the realization that these weren't  
13 intentionally blacked-out markings  
14 but were in fact red-lined  
15 provisions.

16 And right before we resumed  
17 after lunch Mr. Harris provided me  
18 with legible copies of the drafts.  
19 So I guess I'm going to have the  
20 court reporter mark them, and I'm  
21 just going to run through and ask you  
22 a few questions. Okay.

23 A. Okay.

24 (Vandeven Exhibits 8, 9 &



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 10 were marked for identification,  
2 respectively.)

3 MS. FLAX: For the record,  
4 what has been marked as Vandeven-8 is  
5 a June 26 e-mail from Mark Hawley to  
6 Jay Vandeven attaching a draft expert  
7 report of Jay Vandeven dated June  
8 24th, 2006.

9 Vandeven-9 is a June 27,  
10 2006 e-mail from Mark Hawley to Jay  
11 Vandeven attaching a draft expert  
12 report of Jay Vandeven dated June  
13 blank, 2006.

14 And Vandeven-10 is a June  
15 28, 2006 e-mail from Mark Hawley to  
16 Jay Vandeven attaching a draft expert  
17 report of Jay Vandeven dated June  
18 blank, 2006.

19 BY MS. FLAX:

20 Q. I'm going to come to you,  
21 because we only have one copy.

22 A. Okay.

23 Q. On Page 2 of Vandeven-8  
24 there is a highlighted provision that



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 says, "The RI Report says 39.9 but  
2 the Removal Action Report says 33.3.

3 Although the RI refers to  
4 an HRS report dated 9/4/87 no HRS  
5 scoring documents are listed on the  
6 EPA website or identified in the BSAI  
7 index."

8 Do you see that?

9 A. Yes.

10 Q. Tell me what the  
11 significance of 39.9 versus 33.3 is.

12 A. I don't think it has any  
13 real significance. We were just  
14 trying to be as precise and accurate  
15 as possible about what the HRS score  
16 was at the site.

17 And we had, again, as it  
18 says, the RI, the remedial  
19 investigation report says that the  
20 HRS score was 39.9, but then there's  
21 another report that says it was 33.3.

22 So since there was no HRS  
23 package in the administrative record,  
24 that was an issue that we were trying



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 to figure out. It has no real  
2 significance. A site is on the NPL  
3 if it scores above 28 and a half.

4 Q. So it doesn't matter  
5 whether it is 33.3 or 39.9?

6 A. Not at all.

7 Q. Is there a reason why you  
8 selected to include 39.9 as opposed  
9 to 33.3 as the HRS?

10 A. The RI is generally the  
11 more authoritative document than a  
12 Removal Action Report.

13 Q. On Page 5 of Vandeven-8 in  
14 highlighting it says, "This list will  
15 be the basis for Jay's opinions that  
16 the response actions were consistent  
17 with the NCP. What specific  
18 technical concerns should we try to  
19 address in that opinion?"

20 Who is asking this  
21 question?

22 A. I don't know. We are, a  
23 combination of Mark and I, at this  
24 point.



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 Q. And who is the question  
2 being posed to, a third party?

3 A. No. This could just be  
4 carrying through -- I mean, very  
5 often when we write reports like this  
6 if there's questions that we have, we  
7 will write down the question just so  
8 we don't forget about it.

9 So it is not necessarily  
10 directed to anybody else except to  
11 ourselves.

12 Q. And you do it in third  
13 person?

14 A. Very often, yes.

15 Q. Were there any specific  
16 technical concerns that you were  
17 faced with?

18 A. I don't recall any  
19 associated with this, no.

20 Q. On Page 10 of Vandeven-8 in  
21 the long highlighted section at the  
22 bottom of the page or the end of the  
23 page says, "To be continued, but how  
24 do we tie in the specific wastes that



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1 are of interest to Glenn without  
2 saying why Jay believes they were  
3 sent to the site?"

4 Do you see that?

5 A. Yes.

6 Q. I believe you have  
7 testified that you are not offering  
8 an opinion as to whether or not any  
9 party's wastes were disposed of at  
10 the site. Is that correct?

11 A. That is correct.

12 Q. So this was beyond the  
13 scope of your assignment.

14 A. Right. And that -- that's  
15 correct.

16 Q. And that's why it was not  
17 in your final report.

18 A. That's right.

19 Q. And on Vandeven-9 at Page  
20 10 there's highlighting that says,  
21 "Jay, I put the word actions in blue  
22 below because I have tried to refer  
23 consistently to response activities.

24 The NCP describes removal



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 actions, remedial actions and other  
2 activities, so I was trying to be  
3 all-inclusive by using response  
4 activities."

5 Do you see that?

6 A. Correct.

7 Q. Do you know what was meant  
8 by this statement?

9 A. I believe so. We are  
10 talking here about how we referred to  
11 the different activities at the site,  
12 whether or not we referred to them as  
13 actions or activities or response  
14 actions.

15 It really is just semantics  
16 and just trying to be consistent. I  
17 generally try to refer to all  
18 activities at a Superfund site, an  
19 NPL site as response activities,  
20 because that's how the National  
21 Contingency Plan refers to them.

22 Q. I'm going on to Page 11 of  
23 Vandeven-9 at the bottom of the page  
24 in highlighted print it says, "Jay, I



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1 copied in the material you prepared  
2 but have not otherwise added to the  
3 NCP opinion.

4 I will provide a statement  
5 re costs that says how much for each  
6 element of the OU1 and OU2 RD/RAs  
7 based on the demax spreadsheet  
8 summaries.

9 I will see what we have re  
10 EPA's response cost (11 million  
11 claims settled for 7 million). "

12 I don't recall seeing any  
13 mention of the EPA response cost of  
14 11 million that settled for 7 million  
15 in your report. Did you address  
16 that?

17 A. I think we addressed -- I  
18 think what this comment refers to, I  
19 asked -- I probably asked Mark to go  
20 back and see if we had information  
21 about what breakdown of costs we had  
22 and to try to -- I wanted to get  
23 those in if we could associate  
24 specific activities with specific



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1 cost information that we had.

2 I don't believe that we  
3 addressed specifically the 11 million  
4 and the \$7 million dollars.

5 Q. Is the \$7 million  
6 settlement consistent with the NCP?

7 MR. HARRIS: Objection to  
8 the form.

9 THE WITNESS: Yes, I'm not  
10 sure I understand.

11 BY MS. FLAX:

12 Q. Yes, I misstated it. In  
13 your opinion regarding the  
14 reasonableness of past costs, is the  
15 \$7 million included in that opinion?

16 A. Yes.

17 Q. And that's a recoverable  
18 cost?

19 A. I'm not sure what you mean  
20 by recoverable cost.

21 Q. On Page 13 of Vandeven-9 in  
22 highlighting at the end of the third  
23 bullet it says, "Should we delete  
24 this? Glenn doesn't want to suggest



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 that any activities were due to drums  
2 alone."

3 What about this paragraph  
4 suggests or may suggest that any  
5 activities were due to drums alone?

6 A. Well, in the first sentence  
7 I say, "Although the primary  
8 contaminants of concern addressed by  
9 the remedy described in the ROD are  
10 VOCs and metals, the earlier response  
11 activities (in particular the  
12 emergency removal actions) were  
13 necessary to address the potential  
14 threat associated with the buried  
15 drums."

16 So I think what this  
17 highlighted piece refers to is I  
18 wanted to be careful throughout these  
19 reports that although there was a lot  
20 of work done to remove buried drums  
21 at the site, all those removal  
22 actions also removed contaminated  
23 soil, too.

24 So that's probably what



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 that comment refers to.

2 Q. Mr. Vandeven, on Vandeven-  
3 10 at Page 12 there's two separate  
4 highlighted statements.

5 The first one reads, "Jay,  
6 I don't know what to say here about  
7 EPA's agreement with the PRP groups  
8 to split the remedy into two OUs and  
9 allow them to perform the RD/RA.

10 Is this something we've  
11 addressed in previous cases? Do we  
12 have to discuss it here?"

13 You did not in fact discuss  
14 the EPA's agreement with the PRP  
15 groups to split the remedy into two  
16 OUs in either your affirmative report  
17 or your rebuttal report. Correct?

18 A. I don't think we talked  
19 about the EPA's agreement. I think  
20 this statement here refers to, again,  
21 Mark writing primarily in this  
22 section about the sequence of  
23 activities at the site.

24 I wanted to try to be as



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 complete as possible. And if there  
2 was information about the details of  
3 splitting it between OU1 and OU2, I  
4 wanted to include that if we could.

5 Q. So you were just looking at  
6 it from a factual perspective as  
7 opposed to forming an opinion as to  
8 the validity or viability of  
9 splitting the remedy into two OUs.  
10 Correct?

11 A. That's correct.

12 MS. FLAX: Just a second.  
13 I think I may be done. That's all I  
14 have.

15 MR. HARRIS: Who is next?

16 MR. PETTIT: I guess I am.

17 EXAMINATION

18 BY MR. PETTIT:

19 Q. Are you all right,  
20 Mr. Vandeven?

21 A. I'm fine.

22 Q. Okay. My name is Jeffrey  
23 Pettit. I represent Ashland in this  
24 matter.



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1 I am going to have quite a  
2 few questions for you, which we may  
3 not get complete by the time -- I  
4 know we were talking about adjourning  
5 today, but I will get started. I had  
6 a couple of follow-up questions to  
7 Ms. Flax's questions to you.

8 In reference to Vandeven-2,  
9 which was an e-mail about the  
10 probabilistic analysis, in your  
11 experience is a probabilistic  
12 analysis usually reduced to writing?

13 A. Not necessarily. It could  
14 just be reduced to numbers.

15 Q. Okay. Is there some kind  
16 of written work product that would  
17 either reflect numbers or words?

18 A. There could be.

19 Q. And in your experience  
20 under what circumstances would there  
21 be some kind of writing, whether it  
22 is numbers or text?

23 A. Well, if you were going to  
24 use it for something specific, I



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1 would think that it would be reduced  
2 to some kind of writing or text.

3 Q. And do you recall seeing  
4 such an analysis in connection with  
5 the Boarhead site at any time?

6 A. I don't.

7 Q. And if you were to do a  
8 probabilistic analysis as you have  
9 done in your experience, what would  
10 be the nature of that as applied to  
11 the Boarhead site, as you know the  
12 Boarhead site?

13 A. I don't know. I could -- I  
14 mean, that would just be speculation,  
15 coming up with some way that a  
16 probabilistic analysis could apply to  
17 the Boarhead site.

18 I don't have any specific  
19 information about how it was used or  
20 how it is contemplated to be used.

21 Q. Well, in general, what is  
22 the final product of a probabilistic  
23 analysis, if you could give me some  
24 help on that? And in specific, take



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 any example if you want from some  
2 other project that you worked on.

3 A. Well, it depends on the  
4 nature of the analysis. A  
5 probabilistic analysis could include,  
6 you know, the probability that that  
7 refinery over there is going to have  
8 a major explosion in the next year.

9 And so to go about that you  
10 would look at each individual  
11 component that would go into causing  
12 that explosion, you would associate  
13 probabilities with each of those  
14 events.

15 And then you would  
16 aggregate those probabilities  
17 together to find some distribution of  
18 probabilities that that outcome,  
19 namely an explosion at the refinery,  
20 is going to occur within the next  
21 year.

22 Q. And in connection with a  
23 Superfund site, is the purpose of a  
24 probabilistic analysis to try to



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 associate contaminants with a remedy,  
2 or is there some other purpose to  
3 that?

4 MR. HARRIS: Objection to  
5 the form.

6 THE WITNESS: Usually I  
7 would say that a probabilistic  
8 analysis at a Superfund site,  
9 although I have no indication that  
10 that's what it was -- that it's been  
11 applied at the Boarhead site, I would  
12 think most likely be applied to  
13 determining what the cost would be at  
14 the site, the ultimate cost, the  
15 future cost.

16 BY MR. PETTIT:

17 Q. And what kind of factors  
18 would be examined as a part of that  
19 analysis?

20 A. The nature and extent of  
21 contamination, the regulations that  
22 would apply, the types of remedies  
23 that may apply to certain types of  
24 contaminants and certain types of



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 media.

2 Q. Referring to Dr. Exner, we  
3 had some discussion on and off the  
4 record about your review of  
5 Dr. Exner, and I think you testified  
6 that one of the reasons you reviewed  
7 Dr. Exner's report was to get a  
8 better understanding about acids,  
9 acid waste streams. Am I correct?

10 A. Correct.

11 Q. And do you recall  
12 specifically what you -- with respect  
13 to Ashland, that was one of the  
14 parties addressed by Dr. Exner, do  
15 you recall what you may have reviewed  
16 in terms of the documents that  
17 Dr. Exner relied upon in preparing  
18 his report?

19 A. I don't remember any  
20 specific titles of documents. The  
21 documents that I looked at on that  
22 issue were documents that said  
23 something about the type of acid and  
24 the strength of the acid.



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 I think before, when I did  
2 my initial expert report, and then  
3 even after I read the expert reports  
4 from the other side there was still  
5 no specific information on the types  
6 of acids, I don't believe.

7 Whether it was hydrochloric  
8 acid, sulfuric acid, nitric acid,  
9 whether or not it was concentrated,  
10 dilute. So I looked at Dr. Exner's  
11 report to determine -- well, let me  
12 back up.

13 I think when I read  
14 Dr. Exner's expert report he said  
15 something about the nature of the  
16 acids, what kind of acids they were,  
17 how strong the acids were.

18 And I wanted to include in  
19 my opinion, in my rebuttal opinion  
20 something about the type of acids.

21 And if I was going to  
22 address that, if I was going to  
23 include that in my expert report, I  
24 wanted to go back and look at the



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 underlying documents that Dr. Exner  
2 used so I could adopt that -- in  
3 essence, verify the information that  
4 was contained in his expert report.

5 Q. Were the Ashland acids that  
6 were addressed by Dr. Exner, was that  
7 a type of acid you had not  
8 encountered before in your  
9 experience?

10 A. No. They were common  
11 acids, I believe.

12 Q. Well, tell me why did you  
13 need to refer to Dr. Exner to develop  
14 an understanding about those acids?

15 A. Well, some acids are  
16 stronger than others. A strong  
17 acid -- and then you could have  
18 certain concentrations of acids.

19 So you may have acidic  
20 acid, which is a very dilute acid,  
21 which the rain in Philadelphia is  
22 probably pretty close to acidic acid.

23 Or you can have a very  
24 strong acid, say sulfuric acid or



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 hydrochloric acid. And then even  
2 within a particular kind of acid it  
3 can be more concentrated -- it can be  
4 a concentrated form of that acid.

5 So I looked to his report  
6 to see if there was anything about  
7 those characteristics of the acid,  
8 what kind it was and then how strong  
9 it was.

10 Q. And what understanding did  
11 you develop about the Ashland acids  
12 that were described in Dr. Exner's  
13 report?

14 A. That they contained some  
15 acids that I would consider strong  
16 acids, and that concentration of  
17 those acids was high concentration.

18 Q. Anything else about the  
19 acids?

20 A. I don't believe so, no.

21 Q. And did you review any  
22 information in Dr. Exner's report or  
23 the documents he identified on the  
24 dye wastes from Ashland's facility?



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1           A.       I believe seeing that as a  
2 heading in his report, but I did not  
3 review that in detail, no.

4           Q.       Were there any other waste  
5 streams with respect to Ashland  
6 identified in Dr. Exner's report that  
7 you reviewed in some detail as you  
8 did with the acids you described?

9           A.       I believe I read in some  
10 detail his discussion of the etchant,  
11 but I don't think I used the  
12 information that was contained -- but  
13 I don't recall using his information  
14 on circuit board etchant in my expert  
15 report, but I do remember reviewing  
16 that from his expert report.

17          Q.       Did you review the  
18 transcript of Dr. Exner's deposition  
19 at any point up until today?

20          A.       I believe I briefly looked  
21 through his deposition transcript,  
22 but I don't recall any details from  
23 it.

24          Q.       Do you recall whether that



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 changed your understanding in any way  
2 about the Ashland acids that you had  
3 considered?

4 A. No, it did not.

5 Q. If you could pull out  
6 Vandeven-7, one of the drafts.

7 MR. HARRIS: 7, I think, is  
8 the final one. I could be wrong.

9 MR. PETTIT: This is one of  
10 the things that was taken out about  
11 the cost allocation.

12 MS. FLAX: That's 6.

13 MR. PETTIT: 6. Okay, I  
14 got it.

15 BY MR. PETTIT:

16 Q. I'm sorry, Mr. Vandeven.  
17 This is on Page 7 of Vandeven-6.  
18 Now, on that last line you state --  
19 you provided an opinion at that time  
20 that "equitable allocation would  
21 require consideration of other  
22 factors in addition to those named  
23 above."

24 Could you identify what



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 those other factors were that you  
2 were referring to at the time?

3 MR. HARRIS: Objection to  
4 the form.

5 THE WITNESS: I don't think  
6 I was specifically referring to any  
7 individual factors, just that it  
8 would be -- that what I identified  
9 here is an incomplete list, that it  
10 would include many other factors,  
11 both technical and nontechnical  
12 factors.

13 BY MR. PETTIT:

14 Q. You have done, I think  
15 based on your testimony, you have  
16 performed cost allocations in other  
17 projects. Am I correct?

18 A. That's correct.

19 Q. And when you did that, did  
20 your cost allocation include the  
21 three factors that are identified on  
22 Page 7 of your draft?

23 A. In general I would say yes.

24 Q. And do you recall any other



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1 factors that you may have utilized in  
2 those other projects where you  
3 performed cost allocations?

4 A. Well, yes, but they may  
5 not -- I mean, they wouldn't  
6 necessarily apply here.

7 I used factors such as how  
8 long a particular product was being  
9 produced, the volume of the product  
10 being produced. So those are more  
11 related to operating facilities  
12 rather than a disposal site such as  
13 this.

14 (Vandeven Exhibits 11 & 12  
15 were marked for identification,  
16 respectively.)

17 BY MR. PETTIT:

18 Q. Mr. Vandeven, I'm showing  
19 you a copy of an e-mail from you to  
20 Mark Hawley. The subject is Ashland  
21 Comments, and it refers to an  
22 attachment, it looks like Ashland  
23 with a doc extension.

24 I did not see the



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1 attachment in the records that were  
2 provided to us. I was wondering, and  
3 maybe I missed it, but did you retain  
4 a copy of that? ---

5 A. I don't know if I did or  
6 not. This was likely my initial  
7 comments on reviewing the Ashland  
8 expert report, or the expert report  
9 from the individuals. That was the  
10 one where three individuals --

11 Q. That's correct.

12 A. That's the way I always  
13 refer to it.

14 Q. As far as you know, you  
15 searched your records and provided  
16 everything that was responsive to the  
17 document request to counsel.  
18 Correct?

19 A. That's correct.

20 Q. And if you had it, it would  
21 have been in those documents?

22 A. Yes.

23 Q. And do you recall whether  
24 or not that's been deleted,



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1 misplaced?

2 A. I couldn't say, sitting  
3 here right now.

4 Q. Let me ask you about the  
5 document that has been marked  
6 Vandeven-12. And this is an e-mail  
7 from Jennifer Schulte to Mark Hawley  
8 dated June 26, 2006. Have you had a  
9 chance to read that?

10 A. Yes.

11 Q. Do you recall circumstances  
12 under which this was sent or this  
13 discussion was generated?

14 A. I believe when we first got  
15 the expert reports from the other  
16 side that started to mention  
17 individual waste streams, we  
18 initially started to see what  
19 information we may have on those  
20 waste streams.

21 Again, not knowing exactly  
22 how we were going to address  
23 individual waste streams in my expert  
24 report, we initially tried to see



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1 what information we could find on  
2 waste streams that were mentioned.

3 Q. With respect to the  
4 chemicals that are referenced in this  
5 e-mail, did you find any association  
6 with those chemicals with the  
7 conditions at Boarhead?

8 A. I did not attempt to, no.

9 Q. Let me ask you a couple of  
10 questions about your experience.

11 Have any of the other  
12 projects you have worked on, have you  
13 had experience with acids such as in  
14 the case here you have rendered an  
15 opinion that acids mobilize metals at  
16 Superfund sites?

17 Have you had an occasion to  
18 examine that issue in other  
19 contexts?

20 A. Yes.

21 Q. For example, where? Can  
22 you tell me -- first of all, if you  
23 have any litigation cases I would  
24 like to know about those first.



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1           A.       The only litigation-related  
2 case that I could think of that  
3 specifically addressed -- that had as  
4 a significant component acids and  
5 their propensity to mobilize metals  
6 would be the work that I did for Sun  
7 Oil.

8           Q.       Outside of litigation  
9 cases, can you recall other matters  
10 you have worked on involving acids  
11 mobilizing metals?

12          A.       Well, I mean, on almost any  
13 environmental investigation case has  
14 to do with acidic conditions  
15 mobilizing metals.

16          Q.       Have you rendered an  
17 opinion in any other matter where you  
18 have concluded that acids did in fact  
19 mobilize metals and that contributed  
20 to the response activities at a site?

21          A.       I don't -- I can't recall,  
22 sitting here right now.

23          Q.       How about in the Sun case,  
24 was that an opinion that you rendered



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1 in that case?

2 A. I believe so, yes.

3 Q. And in the Sun case, did  
4 that involve metal bearing acids or  
5 non-metal bearing acids?

6 A. It included both. The  
7 primary source of the acids was a  
8 non-metal bearing acid, though.

9 Q. And what source was that?

10 A. Acid sludges from refinery  
11 waste.

12 Q. And there was also a metal  
13 bearing acid and containing acid in  
14 that case?

15 A. Yes. There were metals in  
16 some of the acids, yes.

17 Q. And was that the same  
18 source?

19 A. I don't recall exactly  
20 where the source of the metals came  
21 from.

22 Q. So in your experience you  
23 have encountered both kinds of acids,  
24 those that contain metals and those



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1 that do not?

2 A. Correct.

3 Q. And I think in your report  
4 you use the term substantial  
5 quantities of metals. Am I correct?

6 A. I may have used those words  
7 together.

8 Q. Okay. Let me ask you  
9 this: How do you differentiate  
10 between a non-metal containing acid  
11 or bearing acid and a metal bearing  
12 acid? Is there some quantity of  
13 metal or some standard by which you  
14 could differentiate between the two?

15 A. I won't say that there's  
16 any bright line.

17 If there's an acid waste  
18 that originated from a process where  
19 metals were a part of the process, I  
20 would say that that would be an acid  
21 bearing waste that contained metals,  
22 as opposed to an acid waste that did  
23 not originate from a process that  
24 contained metals.



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1                   It could be a discarded  
2 acid, for instance, just a raw  
3 product.

4           Q.       Now, based upon your  
5 understanding of Ashland's waste  
6 streams, as evidenced by Dr. Exner's  
7 report, where do you put Ashland's  
8 acids, that you consider, in which  
9 category?

10          A.       I consider their acids --  
11 the only thing I did was consider  
12 their acids after looking at  
13 Dr. Exner's report as strong acids.

14          Q.       Did you put them in the  
15 category of acids that originated  
16 from a metal process and therefore  
17 likely to have metal constituents or  
18 the other kind of acid that you just  
19 described?

20          A.       I don't believe I made that  
21 demarcation with their waste.

22          Q.       Do you have an opinion  
23 today which category the Ashland  
24 acids fall into?



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1 A. No.

2 Q. And do you have an  
3 understanding that some metals are  
4 not mobilized by acids?

5 A. I would say that there are  
6 some metals that are mobilized to  
7 greater degrees than other metals by  
8 acidic solutions.

9 Q. And is there a way to  
10 categorize those metals that are  
11 mobilized to a greater extent as  
12 opposed to those that are mobilized  
13 to a lesser extent?

14 A. Again, there is no bright  
15 line. It would depend on the form of  
16 the metal, what compound it was in.  
17 But in general all metals, all  
18 materials can be mobilized by acidic  
19 waste.

20 Q. And in connection with this  
21 particular case, did you develop any  
22 new or additional understanding about  
23 mobilization of metals in the context  
24 of Superfund sites?



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 A. Any new?

2 Q. New understanding.

3 A. No.

4 Q. Now, I noticed in one of  
5 the documents in the materials that  
6 were provided to us was an EPA  
7 groundwater document. Can you tell  
8 me why did you -- is it something you  
9 referred to in connection with this  
10 case in particular?

11 A. I don't -- if it's listed  
12 in my documents that I reviewed, then  
13 I'm sure I reviewed it for something,  
14 but I couldn't say exactly right now  
15 what I reviewed it for.

16 Q. Can you tell me when you  
17 may have reviewed it, in connection  
18 with either the preparation of your  
19 original report or your rebuttal  
20 report?

21 MR. HARRIS: How about if  
22 we make clear what you are referring  
23 to.

24 MR. PETTIT: Okay.



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1 BY MR. PETTIT:

2 Q. I'm referring to the EPA  
3 "Ground Water Issue" Behavior of  
4 Metals in Soils. That was one of the  
5 documents that was provided to you.

6 A. Okay.

7 Q. Can you recall when you --  
8 first of all, is that something you  
9 had in your library?

10 A. Yes. I'm sorry.

11 Q. Or was it something you  
12 obtained particularly in connection  
13 with this case?

14 A. I don't know for sure.  
15 It's very likely that we had this in  
16 our library.

17 Q. And can you recall whether  
18 you reviewed this in connection with  
19 the original report?

20 A. I don't know for sure.

21 Q. And by the way, are there  
22 any other documents -- I will take  
23 that. I'm not going to ask you  
24 anymore questions on that.



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 Are there any other  
2 documents that you have reviewed in  
3 preparation for today's testimony  
4 that is not listed either in your  
5 original report or your rebuttal  
6 report, or like this was not provided  
7 to us by counsel?

8 MR. HARRIS: Documents is a  
9 tricky word. He's testified that he  
10 read expert reports that of course  
11 aren't listed or may or may not be  
12 listed, transcripts. Make sure he  
13 understands what the question was.

14 BY MR. PETTIT:

15 Q. Well, any piece of paper  
16 that has writing on it. I know you  
17 have testified about what you did. I  
18 want to make sure that we know  
19 everything that you reviewed in  
20 preparation for this.

21 A. Everything that's cited in  
22 my two expert reports, in addition to  
23 the expert reports submitted by other  
24 experts, and deposition transcripts.



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1 Q. Okay. If we could turn to  
2 your report. Okay, on Page 1, and  
3 particularly Item No. 2 at the top.

4 MR. HARRIS: Which report?

5 MR. PETTIT: The original.  
6 I'm sorry. Vandeven-1.

7 BY MR. PETTIT:

8 Q. You identify two topics you  
9 were asked to give an opinion on, and  
10 the second one is what I'm referring  
11 to, the relationship between the  
12 wastes that were disposed of at the  
13 site and environmental conditions  
14 that led to response activities.

15 My first question is how  
16 did you define wastes in connection  
17 with that topic?

18 A. Well, I was -- I didn't  
19 restrict myself in any way. Any  
20 information about the types of wastes  
21 or the form of wastes disposed of at  
22 the site.

23 So it would include  
24 information about any bulk liquids



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 that were disposed of at the site,  
2 drum liquids, specific kinds of  
3 contaminants that were found at the  
4 site from metals to chlorinated  
5 solvents.

6 So I didn't -- any  
7 information that I had on wastes that  
8 were or may have been disposed of at  
9 the site.

10 Q. Now, on Page -- if you  
11 could go to Page 10.

12 And that last paragraph  
13 before the bullet on the bottom you  
14 state, "I have reviewed the record  
15 for the site and concluded that the  
16 response actions taken were necessary  
17 to respond to documented threats and  
18 risks posed by hazardous substances  
19 at the site."

20 Now, is that the same as  
21 the waste you just talked about in  
22 connection with the topic that you  
23 were addressing?

24 A. Can you repeat that?



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 Q. Sure. I want to -- when  
2 you use the term hazardous substances  
3 on Page 10, is that the same as the  
4 wastes that were disposed at the site  
5 that you reference on Page 1?

6 A. I would say that the  
7 hazardous substances would be part of  
8 the wastes that were disposed of at  
9 the site.

10 Q. And how would you define  
11 those hazardous substances? So we  
12 differentiate between the wastes and  
13 the hazardous substances?

14 A. Well, hazardous substances  
15 has a specific CERCLA definition, a  
16 specific regulatory definition.

17 So CERCLA responds to  
18 releases or threats of releases of  
19 hazardous substances, which is a  
20 specific list of contaminants and  
21 constituents.

22 Q. And by that, is that the  
23 same as the RCRA hazardous waste that  
24 you've identified -- the term you



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 used on Page 14 of your report?

2 MR. HARRIS: Objection to  
3 the form.

4 THE WITNESS: No...

5 BY MR. PETTIT:

6 Q. So I'm trying to understand  
7 when you use the term wastes or  
8 hazardous wastes that I have the  
9 universe of what you are talking  
10 about, because they are used  
11 interchangeably, and I just want to  
12 have an understanding.

13 So can we just -- I think  
14 we have defined what you meant by  
15 waste in your topic, okay. On Page 4  
16 you used the term hazardous waste in  
17 connection with CERCLA, and now is  
18 this a third kind of hazardous  
19 waste?

20 A. No. I mean, in  
21 environmental -- the way that the  
22 environmental laws are written,  
23 hazardous waste has a very, very  
24 specific definition, as does



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 hazardous substance.

2 Q. And what is that  
3 definition?

4 A. Well, hazardous waste under  
5 RCRA is defined as either a listed  
6 hazardous waste or a characteristic  
7 hazardous waste.

8 Q. And when you use the term  
9 hazardous waste without the RCRA  
10 qualifier in your report, what are  
11 you referring to, yet another kind of  
12 hazardous waste or a greater list of  
13 hazardous wastes?

14 A. If you would point me to a  
15 specific use of that.

16 Q. On Page 13 in the first  
17 bullet you use the term wide variety  
18 of hazardous substances.

19 A. Right. That's not  
20 hazardous waste.

21 Q. Okay. So what did you mean  
22 by that, the hazardous substances,  
23 when you used it on Page 13 of your  
24 report?



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1           A.       Well, again, with CERCLA  
2       law and the statute and the  
3       implementing regulations,  
4       particularly the NCP define hazardous  
5       substance, which is a long list of  
6       specific chemicals that are -- that  
7       EPA can respond to under the CERCLA  
8       statute.

9           Q.       Okay. And when you use the  
10      term hazardous waste as you did on  
11      Page 14, you are referring to the  
12      RCRA defined hazardous waste?

13          A.       Correct.

14          Q.       And when you use the term  
15      waste, as you did on Page 1, that  
16      includes both hazardous substances,  
17      hazardous wastes and everything else  
18      that you testified about earlier.

19          A.       That would be a broader --  
20      the material that was disposed of at  
21      the site.

22          Q.       Now, on Page 13, in the  
23      second bullet you talk about historic  
24      disposal at the site. I wanted to



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 ask you about the substances. The  
2 ferric chloride, is that a hazardous  
3 substance, a hazardous waste or just  
4 a waste in general?

5 A. I don't -- I don't know if  
6 ferric chloride is listed on CERCLA's  
7 list of hazardous substances. I  
8 would have to look.

9 Q. How about copper ammonium  
10 carbonate?

11 A. The same, I would have to  
12 look.

13 Q. Sulfuric acid?

14 A. Sulfuric acid I believe is.

15 Q. Is a hazardous substance?

16 A. Yes.

17 Q. In that same sentence where  
18 you talked about ferric chloride,  
19 copper ammonium carbonate and  
20 sulfuric acid and other bulk wastes,  
21 and you go on to say spent etchant  
22 solutions, acids and pickle wastes,  
23 generally contain substantial  
24 quantities of metals, all right,



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 could you tell me what do you mean by  
2 substantial?

3 A. Well, again, they would  
4 either be from a process that related  
5 to the use of metals or they were  
6 actually metals themselves.

7 I mean, ferric chloride has  
8 iron in it, iron is a metal. Copper  
9 ammonium carbonate has copper in it,  
10 that's a metal.

11 So it was either they were  
12 from processes that were related to  
13 the use of metals or the actual bulk  
14 waste contained metals.

15 Q. So is it fair to say you  
16 had no specific quantity in mind when  
17 you used the term substantial, it's  
18 more a description of the source of  
19 the waste?

20 A. That's correct.

21 Q. And what metals were you  
22 referring to in that sentence?

23 A. I wasn't distinguishing or  
24 limiting myself to any specific



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1 metals in that sentence.

2 Q. Now, in the next sentence  
3 you state -- you use the term --  
4 okay, in the next -- sorry, the  
5 second sentence after that you use  
6 the word corrosive waste solutions  
7 that did not contain metals.

8 How do you differentiate  
9 that substance from the other  
10 substances involving ferric chloride,  
11 et cetera, in the two sentences  
12 before that?

13 MR. HARRIS: Objection to  
14 the form.

15 THE WITNESS: Well, all I'm  
16 saying there is, and again the  
17 sentence reads "even corrosive  
18 solutions that did not contain  
19 metals."

20 So even if there was a  
21 solution, as we talked about before,  
22 that was just pure discarded sulfuric  
23 acid, they would have an impact at  
24 the site.



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1                   They would mobilize metals  
2                   from other wastes, they would  
3                   mobilize metals in the soil, and they  
4                   would generally mobilize all  
5                   contaminants that were in the  
6                   subsurface just because of their  
7                   acidic nature.

8                   So even if they did not  
9                   contain metals, they would have an  
10                  impact at the site.

11               BY MR. PETTIT:

12               Q.       And is the word corrosive  
13                   limited to acid or can it include  
14                   base liquids as well, base  
15                   substances?

16               A.       The latter. It can include  
17                   both acidic solutions, that is low pH  
18                   solutions and high pH solutions.

19               Q.       Now, on Page 14 of your  
20                   report, and right to the second  
21                   bullet, you talk about a variety of  
22                   wastes. Then you use the term  
23                   collectively these wastes exhibited  
24                   the characteristics of ignitability,



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1 corrosivity, reactivity and toxicity.

2 Now, I'm focusing on the  
3 word collectively. Does that mean  
4 all of those substances or just some  
5 of them?

6 A. I believe that's referring  
7 to the materials that were in the  
8 drums.

9 Q. Right. And my question is  
10 did you mean to say by that sentence  
11 that all substances in the drums  
12 exhibited those characteristics or  
13 only some of them?

14 A. I believe what that is  
15 referring to is that all of them had  
16 some of these characteristics.

17 All of them were RCRA  
18 hazardous wastes based on some RCRA  
19 criteria; either they were ignitable,  
20 corrosive, reactive, or they failed  
21 the EP tox test.

22 Q. And then the next bullet  
23 you talk about substances that are  
24 not considered RCRA hazardous waste



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1 and that contribute to environmental  
2 conditions. Am I correct?

3 A. Correct.

4 Q. And you use an example of  
5 PCBs. Are there any other substances  
6 that you are aware of that would meet  
7 that criteria?

8 MR. HARRIS: Objection to  
9 the form.

10 THE WITNESS: That are  
11 not --

12 BY MR. PETTIT:

13 Q. That are not considered  
14 RCRA hazardous wastes but could  
15 contribute to environmental  
16 conditions addressed by the response  
17 activities at Boarhead.

18 A. No, I'm not.

19 Q. And you go on to say in  
20 this bullet with respect to the RCRA  
21 characteristics of corrosivity that  
22 means that the substance exhibits a  
23 pH between 2 and 12.5. Am I correct?

24 A. That do not exhibit.



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1 Q. Right. So if a substance  
2 has a pH between 2 and 12.5, it is  
3 not considered corrosive under RCRA.  
4 Am I correct?

5 A. That's correct.

6 Q. And by the same token, if  
7 it's less than pH of 2 it's  
8 considered corrosive under RCRA. Am  
9 I correct?

10 A. That's correct.

11 Q. And if it exceeds 12.5 it's  
12 also considered corrosive under  
13 RCRA.

14 A. Correct.

15 Q. Now, on Page 16, this will  
16 be the second full paragraph, you  
17 talk about -- this is the fourth  
18 sentence, "these and other wastes  
19 released in bulk -- " do you see  
20 that?

21 A. Yes.

22 Q. -- "were generally  
23 corrosive and likely contained  
24 substantial quantities of metals,"



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1 and you identify them. What basis do  
2 you have for, first of all, that they  
3 were generally corrosive?

4 A. The description of the  
5 wastes in the underlying documents,  
6 sulfuric acid, for instance is an  
7 acid that's going to very likely have  
8 a pH of less than 2 and be corrosive.

9 And, again, here we are not  
10 necessarily -- we are not necessarily  
11 talking about corrosive under RCRA,  
12 that is a pH less than 2.

13 It could be a pH higher  
14 than 2 but still be corrosive, still  
15 mobilize metals and still promote the  
16 deterioration of drums. So the  
17 description of the wastes contributes  
18 to determining whether or not they  
19 are corrosive.

20 Q. Is there a pH that you  
21 would consider a substance not to be  
22 corrosive?

23 A. 7.

24 Q. That's neutral?



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1 A. That's neutral.

2 Q. Anything but that?

3 A. No. I wouldn't say  
4 anything but that, but generally --  
5 anything below 7 can be corrosive.

6 Q. And again, in this sentence  
7 you use the word "substantial  
8 quantities of metals." Did you have  
9 a specific quantity in mind when you  
10 wrote that?

11 A. No.

12 Q. Is there a minimum quantity  
13 that would satisfy your definition of  
14 substantial quantities, percentage  
15 or --

16 A. No.

17 Q. So is it your opinion that  
18 bulk wastes that generally are  
19 corrosive contain substantial  
20 quantities of metals drive the need  
21 for remediation at Boarhead?

22 A. I would say that wastes  
23 that contain metals contributed to  
24 the need for and cost of remediation



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1 at Boarhead Farms, yes.

2 Q. And how about the wastes  
3 that are not corrosive, do they  
4 contribute to the need to remediate  
5 the Boarhead site?

6 A. What wastes are those?

7 Q. Well, you have used -- I'm  
8 trying to understand. In this  
9 section, generally corrosive wastes  
10 that contain substantial quantities  
11 of metals, and they are connected to  
12 the remedy.

13 So the converse of that or  
14 one of the different kind of wastes  
15 would be a noncorrosive waste, so my  
16 question is did that contribute to  
17 the remedy at Boarhead?

18 MR. HARRIS: Objection to  
19 the form.

20 THE WITNESS: If you had a  
21 drum of trichloroethylene that was  
22 not corrosive or a bulk load of  
23 another chlorinated solvent that may  
24 not have had a low pH, I would say



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1 that that absolutely did contribute  
2 to the need for remediation at the  
3 site.

4 BY MR. PETTIT:

5 Q. How about wastes that are  
6 corrosive as you have just defined it  
7 but do not contain metals, did they  
8 contribute to the need for  
9 remediation at the site?

10 A. Yes.

11 Q. I'm just trying to find the  
12 right page. You referred to solvent-  
13 containing wastes. That is on Page  
14 15, the bottom of 15. And the first  
15 category you talk about are  
16 halogenated solvents.

17 And do you have any  
18 information on the quantity of  
19 halogenated solvents that were  
20 disposed of at Boarhead?

21 A. A specific quantity, no.

22 Q. Is there any minimum  
23 quantity, in your opinion, that would  
24 be related to the remedy at Boarhead?



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1 A. No.

2 Q. So am I correct to assume  
3 it means any quantity that is present  
4 at Boarhead would have been related  
5 to the remedy?

6 A. I would say that any  
7 halogenated solvent like  
8 trichloroethylene that was disposed  
9 of at the site contributed to the  
10 remedy.

11 Q. Any other halogenated  
12 solvents that fall into that category  
13 that you understand were disposed of  
14 at Boarhead?

15 A. I don't recall right now  
16 any other halogenated compounds  
17 except trichloroethylene. There may  
18 have been others,  
19 tetrachloroethylene, but I don't  
20 recall sitting here right now.

21 Q. You also talk about  
22 nonhalogenated solvents. Again, do  
23 you have any information on the  
24 quantities of nonhalogenated solvents



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1 that were disposed of at Boarhead?

2 A. No.

3 Q. Is there any minimum  
4 quantity had they been disposed of at  
5 Boarhead that would have been related  
6 to the remedy at the Boarhead Farms  
7 site?

8 A. I did not develop an  
9 opinion about that, no.

10 THE WITNESS: If you are at  
11 a point, this is probably --

12 MR. PETTIT: Yes.

13 (Recess taken)

14 BY MR. PETTIT:

15 Q. Mr. Vandeven, I want to  
16 draw your attention to the bottom of  
17 Page 5 of your report, your original  
18 report. And there you set forth the  
19 components of the remedy known as  
20 OU2. Am I correct?

21 A. Yes.

22 Q. In the beginning of that  
23 paragraph, Paragraph 12 you state a  
24 group of PRPs that form the RD/RA



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1 actions for OU2. Do you know what  
2 group of PRPs performed the RD/RA  
3 actions for OU2?

4 A. Not specifically, no.

5 Q. Now, with respect to the  
6 first component of the OU2 remedy  
7 which you identify as the soil  
8 aeration and treatment of VOC hot  
9 spots, did the wastes that you  
10 described as corrosive waste  
11 solutions without substantial  
12 quantities of metals drive the soil  
13 aeration treatment and VOC hot spots  
14 in OU2?

15 MR. HARRIS: Objection to  
16 the form.

17 THE WITNESS: It could have  
18 contributed to that, yes.

19 BY MR. PETTIT:

20 Q. And in what way could it  
21 have contributed?

22 A. As I said before, corrosive  
23 wastes would have mobilized not only  
24 metals but can mobilize any



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 contaminant in a subsurface.

2 So, for example, if you  
3 have a contaminant that's addressed  
4 by the soil aeration remedy, say  
5 trichloroethylene, and that was  
6 present and absorbed to the soil at  
7 the site, if that came in contact  
8 with an acid waste, that acid waste  
9 would immobilize that  
10 trichloroethylene and spread it over  
11 a larger area, so to that extent it  
12 would contribute to the soil aeration  
13 and treatment remedy.

14 Q. Am I correct that the VOC  
15 hot spots in OU2 were in specific  
16 areas at the site?

17 A. They were in defined areas,  
18 yes.

19 Q. So is it fair to say that  
20 the corrosive waste solutions without  
21 substantial quantities of metal would  
22 have to be located in some vicinity  
23 of those hot spots in order to have  
24 the effect that you just described?



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1           A.       They would have to come in  
2       contact with them, yes.

3           Q.       And if they were down  
4       gradient from those hot spots, would  
5       it be your opinion that they would  
6       not have contributed to the soil  
7       aeration and treatment of those hot  
8       spots?

9           A.       If you could show that they  
10       never came in contact with  
11       VOC-contaminated soil, then I would  
12       agree that they wouldn't have  
13       contributed.

14          Q.       And if the disposal of  
15       those wastes were down gradient,  
16       under what circumstances could they  
17       become in contact with the VOC hot  
18       spots?

19          A.       Well, when you say down  
20       gradient --

21          Q.       I mean downhill.

22          A.       Okay, that's different.  
23       Downhill does not mean down gradient  
24       to me.



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1 Q. Okay. Then I will use the  
2 word downhill.

3 A. Downhill.

4 Q. Yes.

5 A. So if they were found  
6 downhill of the VOC spots.

7 Q. Or the evidence is that  
8 they were disposed of downhill from  
9 the VOC hot spots. My question is  
10 under what circumstances could they  
11 have contributed to the soil aeration  
12 treatment of those hot spots?

13 A. Well, if they were found  
14 downhill, as you put it, they could  
15 have originated from uphill and flown  
16 downhill.

17 Q. I didn't say found, I said  
18 disposed of downhill. Assuming the  
19 evidence establishes they were  
20 actually discharged at a location  
21 downhill from the VOC hot spots.

22 A. If they were disposed of  
23 downhill, they could have migrated in  
24 the subsurface to areas where the VOC



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1 hot spots were.

2 Q. And is that your opinion?  
3 Do you have an opinion on that?

4 A. I don't have any specific  
5 information that that phenomenon  
6 occurred, but I'm just responding to  
7 your -- what I thought was a  
8 hypothetical.

9 Q. Okay. Another component of  
10 the OU2 remedy that you identified is  
11 the excavation and off-site disposal  
12 of buried drums. Am I correct?

13 A. Correct.

14 Q. And in your opinion, did  
15 corrosive waste solutions without  
16 substantial quantities of metal  
17 contribute to the excavation and  
18 off-site disposal of buried drums?

19 A. It could have, yes.

20 Q. And I think you have  
21 offered in your report that it would  
22 have assisted with the deterioration  
23 of the drums, am I correct? That's  
24 one way that would have occurred?



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1           A.       That's correct. That's one  
2 way. It could have also mobilized  
3 materials that were released from the  
4 drums.

5                   And, again, the buried drum  
6 remedy, as I have said from the  
7 start, buried drums do not just  
8 include excavation of buried drums,  
9 but it includes soil, contaminated  
10 soil around the buried drums.

11           Q.       And typically at a site  
12 like this they excavate not only the  
13 drums but the soil around the drums.  
14 Am I correct?

15           A.       Correct.

16           Q.       And you can usually define  
17 that area by the documents that the  
18 contractor generates as a result of  
19 that, am I right? You would know how  
20 much soil or how far the soil  
21 surrounding the drums was excavated.

22           A.       Correct.

23           Q.       Now, again, assuming that  
24 the corrosive wastes without



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1 substantial quantities of metals was  
2 discharged at a location downhill  
3 from the site of the drums, would it  
4 be your opinion that that waste would  
5 have assisted the deterioration of  
6 the drums?

7 A. It could have, yes.

8 Q. And in what way?

9 A. Well, any number of ways.  
10 Again, it could have -- when it gets  
11 into the subsurface it could migrate  
12 to the area of the drums.

13 This, again, was a very --  
14 this wasn't a routine operation, a  
15 routine disposal site that  
16 Mr. DeRewal operated that was -- he  
17 did lots of different things there.

18 It's not -- it's possible  
19 that soil from one area was used to  
20 bury the drums.

21 So you could have had soil  
22 moved from one place to another and  
23 that could have created a situation  
24 where soil that had contained acidic



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1 waste came in contact with drums.

2 Q. Do you have any evidence  
3 that occurred at this site?

4 A. I don't recall seeing  
5 anything specific like that, but,  
6 again, there was very little on how  
7 he actually operated the site.

8 Q. And you also stated that  
9 another way that the kind of wastes I  
10 was talking about could contribute to  
11 the excavation and off-site disposal  
12 of buried drums was by mobilizing  
13 metals and the substances in these  
14 drums. Correct?

15 A. Correct.

16 Q. Again, would that be true  
17 if the disposal site of the waste was  
18 downhill from where the drums were  
19 buried?

20 A. Again, it's possible, if it  
21 migrated in the subsurface to the  
22 location of the buried drums.

23 Q. And again, and you were not  
24 asked to give an opinion on that, am



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1 I right, in this case?

2 A. That specific phenomena,  
3 no, I was not.

4 Q. Are you aware of any data  
5 in the Boarhead record that would  
6 indicate migration uphill of  
7 substances in that part of the  
8 ground?

9 A. Again, you are confusing --  
10 I didn't say anything about uphill, I  
11 didn't say contaminants migrated  
12 uphill. You are referring to a  
13 topographic characteristic. I'm  
14 referring to a subsurface  
15 characteristic.

16 Q. Okay. Let me ask you this  
17 way: If you assume that the wastes  
18 I'm talking about were discharged in  
19 the ground downhill from the site of  
20 where these particular drums were  
21 located in OU2, did you do any  
22 investigation or find any data that  
23 would indicate that substances moved  
24 uphill to that area?



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 MR. HARRIS: Objection to  
2 the form.

3 THE WITNESS: No.

4 BY MR. PETTIT:

5 Q. Isn't it true that the  
6 contents of the drums in this area in  
7 OU2 would have had to have been  
8 removed, whether they are in the  
9 drums or the drums had deteriorated  
10 and the contents spilled out in the  
11 soil underneath?

12 MR. HARRIS: Objection to  
13 the form.

14 THE WITNESS: Can you  
15 repeat or rephrase that?

16 BY MR. PETTIT:

17 Q. Sure.

18 If there was nothing to  
19 accelerate the deterioration of the  
20 drums in this location of OU2, the  
21 drums would have been removed and  
22 some degree of soil may have been  
23 removed around the drums. Am I  
24 correct?



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1 MR. HARRIS: Objection to  
2 the form.

3 THE WITNESS: Yes.

4 BY MR. PETTIT:

5 Q. And if your opinion is  
6 correct that certain waste solutions  
7 acted on the drums to deteriorate the  
8 drums spilling the -- releasing the  
9 contents of the drums, all that would  
10 have occurred is that the waste in  
11 the drums and some additional  
12 surrounding soil would have been  
13 removed.

14 A. No, not -- that would not  
15 have been the only effect of drums  
16 deteriorating.

17 You could have had material  
18 released from the drums migrating  
19 both in the soil and then downward to  
20 the groundwater, so it would have  
21 been an impact both to the soil and  
22 to the groundwater.

23 Q. But if that occurred, the  
24 contents of the drums would have been



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1 at another location at the Boarhead  
2 Farms. Am I right?

3 A. They could have been in any  
4 number of locations both proximate to  
5 the original drum and at considerable  
6 distances from the drums.

7 Q. But, in any event, the  
8 remediation -- or the activities in  
9 OU2 or OU1 would have addressed the  
10 contents of the drums, whether they  
11 are on an exact area where the drum  
12 was originally located or some other  
13 place in the site?

14 MR. HARRIS: Object to the  
15 form.

16 THE WITNESS: I cannot  
17 follow that.

18 BY MR. PETTIT:

19 Q. The hazardous substances in  
20 the drums had to be remediated as  
21 part of this remedy. Am I correct?

22 A. Correct.

23 Q. If there is no accelerated  
24 deterioration of the drums, the



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 hazardous substances in the drums  
2 would have been removed as part of  
3 the remedy at the site where the  
4 drums were buried?

5 A. I would say that that's a  
6 fair statement.

7 Q. Okay. If the accelerated  
8 deterioration of drums released the  
9 contents into the groundwater, that  
10 still would have been remediated as  
11 well.

12 A. Very likely, yes.

13 Q. And in fact there was  
14 remediation of the groundwater with  
15 many of the substances that were in  
16 those drums. Am I correct?

17 A. Many of the substances that  
18 required remediation in the  
19 groundwater were substances that were  
20 in the drums, yes.

21 Q. So tell me, then, how does  
22 the addition of corrosive waste  
23 without substantial quantities of  
24 metals increase the cost of the



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 remedy if the contents of those drums  
2 had to be removed in any event?

3 A. Well, you actually just  
4 provided the answer to that.

5 If the corrosive waste  
6 deteriorated the drums and released  
7 materials from the drums that then --  
8 and that allowed or exacerbated the  
9 mobility of those materials, then  
10 groundwater needed to be investigated  
11 and remediated, additional soil  
12 needed to be investigated and  
13 remediated, in addition to the  
14 physical removal of that drum.

15 Q. But those things were  
16 already being remediated for other  
17 reasons, were they not, because of  
18 the hot spots and other substances  
19 discharged at Boarhead?

20 A. Well, and that's the core  
21 of my opinion, that all wastes at the  
22 site and all activities at the site  
23 and all forms of waste at the site  
24 contributed to the need for and cost



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1 of the remedy.

2 Yes, there were other  
3 contributors to the need for  
4 groundwater and soil remediation, but  
5 that doesn't negate the fact that  
6 corrosive wastes were contributed to  
7 the need for and cost of the remedy.

8 Q. Now, do you have any data  
9 from the Boarhead site that would  
10 indicate that the corrosive waste  
11 without substantial quantities of  
12 metal did in fact accelerate the  
13 deterioration of those drums?

14 A. Specific evidence? I would  
15 say the primary evidence is the fact  
16 that you do have some drums intact  
17 and some drums have been  
18 deteriorated.

19 So there was some  
20 deterioration of drums and that was  
21 very likely due to acidic conditions  
22 in the subsurface.

23 Q. Are there other conditions  
24 that could have caused that,



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 particularly the deterioration of  
2 some drums and not the others?

3 A. Well, just the original --  
4 the original state of the drum would  
5 have contributed to, and if it was a  
6 rusty drum to begin with, then it  
7 likely deteriorated quicker in the  
8 subsurface, as opposed to an intact  
9 new drum.

10 Q. And in your experience,  
11 have you encountered drums that were  
12 made of particular metals or other  
13 substances that resisted  
14 deterioration while they were in the  
15 ground?

16 A. Well, sure, a fiberglass  
17 drum is not going to deteriorate as  
18 fast as a metal drum. But in sites  
19 like this, I think most of the drums  
20 are in that era, in the late 1960s,  
21 '70s were metal, steel metal drums.

22 Q. Now, am I correct there  
23 were -- and you have mentioned that  
24 there were drum removals in an



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1 earlier time, in 1992 and 1993. Am I  
2 correct?

3 A. That's correct, there were  
4 two removal actions during that time.

5 Q. And if I ask you the same  
6 questions with respect to the effect  
7 of corrosive waste solutions without  
8 substantial quantities of metals,  
9 would your answers be the same?

10 A. Yes.

11 Q. And would that also be true  
12 of the -- you identified some removal  
13 of general ceramic drums, would your  
14 answer be the same with respect to  
15 that removal operation?

16 A. Yes. They were I think  
17 removed for the specific wastes that  
18 they contained, but, again, they  
19 would have been susceptible to the  
20 same deterioration and the same  
21 acidic conditions.

22 Q. Still on Page 5. I want to  
23 move on to OU1. I'm going to start  
24 from the bottom of the various



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1 components of OU1. The first thing  
2 you mentioned were phytoremediation  
3 studies. Could you describe what  
4 that is, just real briefly.

5 A. That's, particularly back  
6 then, it was a new kind of remedy, an  
7 innovative remedy that attempted to  
8 immobilize or treat contaminants  
9 either in soil or groundwater by  
10 using plants and sunlight to  
11 immobilize those compounds.

12 Q. And would that have  
13 addressed metals in groundwater or  
14 soil?

15 MR. HARRIS: Objection to  
16 the form.

17 THE WITNESS: It would have  
18 addressed primarily metals, yes, in  
19 groundwater or soil.

20 BY MR. PETTIT:

21 Q. And was such a study  
22 conducted at the Boarhead site?

23 A. I believe they did do a  
24 study.



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1 Q. And is it your opinion that  
2 corrosive waste solutions without  
3 substantial quantities of metals  
4 would have been related to a  
5 phytoremediation study at the  
6 Boarhead site?

7 A. Yes.

8 Q. And in what way?

9 A. Again, it would have  
10 contributed to the nature and extent  
11 of metal contamination at the site.

12 Corrosive waste would have  
13 mobilized the metals and contributed  
14 to where you are finding metals and  
15 the level of metals that you are  
16 finding.

17 Q. And what data do you have  
18 that you rely upon to reach that  
19 conclusion?

20 A. Again, the information  
21 about the nature of the wastes that  
22 were disposed of, that they were  
23 acidic wastes, the RI information  
24 regarding where they were finding



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1 metals, the level of metals that they  
2 were finding, the types of metals  
3 that they were finding, and then my  
4 expertise and experience on how  
5 metals behave in a subsurface.

6 Q. Where they were finding  
7 metals, how does that relate to that  
8 remedy?

9 A. The fact that they are  
10 finding metals throughout the site  
11 creates the need to address metals in  
12 the subsurface. They were finding  
13 metals that needed to be addressed  
14 both in soil and groundwater  
15 throughout the site.

16 Q. And you also, in connection  
17 with the OUI remedy you identified  
18 residential water treatment as a  
19 component of that.

20 Are the corrosive waste  
21 solutions without substantial  
22 quantities of metal related to the  
23 residential water treatment  
24 component?



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1 A. Yes.

2 Q. In what way?

3 A. The same way, they would  
4 have contributed to the mobility of  
5 metals in the subsurface. They could  
6 have also contributed to the mobility  
7 of organic compounds in the  
8 subsurface.

9 And the residential water  
10 treatment units address both organic  
11 and inorganic contaminants.

12 Q. Am I correct that the  
13 residential water wells are off site,  
14 in other words the residences are off  
15 site?

16 A. I believe there was one  
17 well on site, too.

18 Q. And the water treatment was  
19 addressing the well water on those  
20 off-site locations and the one that's  
21 on site.

22 A. Correct.

23 Q. Didn't the ROD conclude,  
24 however, that the metals detected in



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1 the off-site wells were due to the  
2 diabase rock formation?

3 A. I'm not sure if they  
4 conclusively determined that or not.  
5 But, again, that goes back to the  
6 question that we addressed before.  
7 You could have acidic solutions that  
8 mobilize metals in the natural soils.

9 So it's possible that that  
10 diabase which contains high  
11 concentrations of metals, those  
12 metals were mobilized because of the  
13 acidic wastes that were disposed of  
14 at the site.

15 Q. Do you have any data to  
16 indicate that the acidic conditions  
17 reached these off-site wells?

18 MR. HARRIS: Objection to  
19 the form.

20 THE WITNESS: That acid  
21 conditions reached --

22 BY MR. PETTIT:

23 Q. Acidic groundwater reached  
24 the off-site wells.



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1 A. No.

2 Q. And just so I understand,  
3 your opinion about the mobilization  
4 of metals is the acidic nature of the  
5 groundwater created by the addition  
6 of corrosive wastes. Am I correct?

7 A. That's correct. That  
8 creates the initial mobilization of  
9 the metal. The acidic condition, if  
10 you will, doesn't have to follow that  
11 metal throughout the site.

12 That acidic condition can  
13 mobilize the metal. Once mobilized,  
14 the metal may stay mobilized.

15 Q. Does that assume, however,  
16 that the media, let's say it's  
17 groundwater, that has metals which  
18 have been initially mobilized, is it  
19 your opinion that that water does no  
20 longer have to be acidic to  
21 transport those metals that have been  
22 mobilized?

23 A. Exactly.

24 Q. And is it your opinion that



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1 if the pH of that groundwater were to  
2 increase say to 7, that those metals  
3 nevertheless would still stay in that  
4 groundwater?

5 A. They would -- that  
6 geochemistry is very complex, but  
7 some of the metals would definitely  
8 stay dissolved in the groundwater.

9 Q. But not all the metals?

10 A. Again, it depends on other  
11 factors, not just pH. PH is just but  
12 one factor.

13 Q. And what are the other  
14 factors?

15 A. Temperature. The -- what's  
16 referred to as the EH conditions of  
17 the groundwater, the other electron  
18 acceptors or donators in the  
19 groundwater, the concentration of  
20 other compounds in the groundwater  
21 that the dissolved metal could bind  
22 with, the concentration of organic  
23 material in the groundwater and in  
24 the aquifer that the metal could bind



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1 with.

2 Q. Anything else?

3 A. I think that's a pretty  
4 thorough list.

5 Q. Did you review any data in  
6 connection with your opinion that  
7 addresses any of those items?

8 A. We may -- I may have  
9 mentioned generally what those  
10 conditions were in one of my  
11 opinions. I don't recall if I did or  
12 not.

13 Q. But I'm asking you did you  
14 see any data from the Boarhead site  
15 that would give you information on  
16 any of those factors that you just  
17 identified?

18 A. I don't recall if I did or  
19 not.

20 Q. In your experience in  
21 connection with Superfund sites, is  
22 that kind of data measured in  
23 connection with either the RI or the  
24 RF?



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 MR. HARRIS: Objection to  
2 the form.

3 THE WITNESS: I'm not sure  
4 what an RF is.

5 BY MR. PETTIT:

6 Q. I'm sorry, FS, Feasibility  
7 Study.

8 A. It can be. Very often it  
9 is, but it's not necessarily  
10 information that's gathered as part  
11 of RI/FS.

12 Q. Another component of OU1  
13 that you identify was the  
14 installation of additional monitoring  
15 wells. What was the purpose, as you  
16 recall it, for the decision to  
17 install additional monitoring wells?

18 A. To get further  
19 characterization information, to  
20 understand exactly where the  
21 contaminants were at the site.

22 Q. And, in your opinion, did  
23 the discharge of corrosive wastes  
24 without substantial quantities of



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 metal necessitate the installation of  
2 additional monitoring wells?

3 MR. HARRIS: Objection to  
4 the form.

5 THE WITNESS: Yes. That  
6 and every other waste -- any  
7 investigation activity or  
8 characterization activity is  
9 necessitated by the totality of the  
10 wastes or chemicals disposed of at  
11 the site.

12 BY MR. PETTIT:

13 Q. So you are putting that as  
14 an investigation function as opposed  
15 to a remedy?

16 A. Well, I'm putting it as  
17 more of a characterization function.

18 Q. Did the discharge of  
19 corrosive waste solutions with  
20 substantial quantities of metals  
21 drive the groundwater extraction  
22 remedy that you have identified in  
23 Paragraph 11 of your report?

24 MR. HARRIS: Objection to



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1 the form.

2 THE WITNESS: Did you say  
3 with or without substantial  
4 quantities?

5 BY MR. PETTIT:

6 Q. Without. Without  
7 substantial quantities.

8 MR. HARRIS: Objection to  
9 the form.

10 THE WITNESS: Yes. Again,  
11 it would have mobilized metals that  
12 were in other wastes, deteriorated  
13 drums that then created a source of  
14 the contaminants to the groundwater  
15 that needed to be treated.

16 It could have mobilized and  
17 solubilized elements like iron that  
18 needed to be addressed in the  
19 groundwater remedy.

20 So it was most definitely a  
21 contributor to the need for  
22 groundwater extraction in metals  
23 precipitation system.

24 BY MR. PETTIT:



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1 Q. Am I correct that there was  
2 a groundwater treatment system before  
3 the OU1 remedy was implemented?

4 A. There was an initial  
5 groundwater interceptor trench, yes.

6 Q. And was the water captured  
7 in that trench being treated?

8 A. I believe it was being  
9 treated, yes.

10 Q. And what was the  
11 enhancement, as you understand it, by  
12 the OU2 remedy for groundwater  
13 extraction?

14 A. I believe they enhanced the  
15 metals precipitation elements of it.  
16 They may have increased the size of  
17 the interceptor trench. I don't  
18 recall if they made any significant  
19 changes to the air stripping system.

20 Q. And does the air stripping  
21 system implemented as part of OU1  
22 address metals at the Boarhead site?

23 A. Not directly, no. That  
24 would have been removing volatile



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1 contaminants.

2 Q. Now, the groundwater  
3 extraction and the metals  
4 precipitation component that you talk  
5 about in Paragraph 11, which metals  
6 are being addressed by that remedy?

7 A. I would have to go back and  
8 look at the ROD to give you a  
9 complete list.

10 Q. I have the ROD here. I  
11 believe it's Page 34. I will hand  
12 you the Record of Decision. That may  
13 have been marked in another  
14 deposition. I don't know if we need  
15 to mark it now. Just let me know  
16 when you are ready to answer some  
17 questions.

18 MR. HARRIS: Well, are you  
19 going to ask him a question? I mean,  
20 do you want him to read the whole  
21 thing?

22 MR. PETTIT: Well, first I  
23 wanted to ask him if he wanted to  
24 look at the Record of Decision, and I



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1 pointed him to Page 34.

2 BY MR. PETTIT:

3 Q. Does that assist you in  
4 identifying what you meant by metals  
5 precipitation in your report as part  
6 of the OU1 remedy?

7 A. This may refer to that part  
8 of the remedy, but I couldn't say for  
9 sure that this is inclusive of every  
10 element of -- or every issue  
11 associated with that remedy.

12 Q. Let me just then talk about  
13 the metals that are identified on  
14 Page 34 of the ROD, then. Do you  
15 have that?

16 A. Yes.

17 Q. Am I correct that the  
18 Record of Decision establish certain  
19 criteria to remediate a series of  
20 metals or several metals and those  
21 metals are arsenic, beryllium,  
22 cadmium, chromium, lead and nickel?

23 A. And zinc.

24 Q. And zinc. And have you



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1 studied any of the data with respect  
2 to Boarhead to determine whether at  
3 the moment the standards identified  
4 on Page 34 have been met or have been  
5 satisfied for any of those metals?

6 MR. HARRIS: Objection to  
7 the form.

8 THE WITNESS: No, I  
9 haven't. Again, you read Section A  
10 of that groundwater treatment.  
11 Right?

12 BY MR. PETTIT:

13 Q. Right.

14 A. And there's Section B which  
15 refers to metals that need to be  
16 treated in accordance with discharge  
17 limitations under the Clean Water Act  
18 in Pennsylvania state regulations.

19 Q. Yes. And the second part  
20 of that, what the state requires, is  
21 it your opinion that those metals  
22 are -- that remedy is associated with  
23 the contamination at Boarhead in that  
24 that's part of the OU1 remedy?



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1           A.     If there's state  
2 regulations that require treatment  
3 before discharge, then that's  
4 absolutely related to the Boarhead  
5 Farms remedy.

6           Q.     And I assume that there is  
7 a cost associated with doing that.  
8 Am I correct?

9           A.     Correct.

10          Q.     Now, going back to Page 13  
11 of your report. I'm looking at the  
12 sentence that's the fourth line from  
13 the bottom. It begins "Most metals  
14 are more soluble in acidic  
15 solutions." Do you see that?

16          A.     Yes.

17          Q.     What do you mean by "most  
18 metals"?

19          A.     By that I mean with very,  
20 very few exceptions metals are more  
21 soluble in acidic solutions.

22          Q.     And what are the  
23 exceptions?

24          A.     I couldn't say, sitting



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1 here right now, but you could have  
2 certain metals where you have other  
3 conditions where they may not be more  
4 soluble in acidic solutions.

5 But in the vast majority of  
6 cases and the vast majority of  
7 situations, acidic solutions are  
8 going to render metals more mobile.

9 Q. Is the mobility of those  
10 metals enhanced if the metal comes  
11 from a manufacturing process that  
12 involves metal as you described as an  
13 acid waste from a metal manufacturing  
14 process and there are metals in that  
15 waste acid?

16 MR. HARRIS: Objection to  
17 the form.

18 BY MR. PETTIT:

19 Q. The mobility is the same  
20 there or is it the same with a  
21 corrosive acid without substantial  
22 quantities of metal, is there a  
23 difference between the two in terms  
24 of the mobility of metals?



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 MR. HARRIS: Objection to  
2 the form.

3 THE WITNESS: Are you  
4 referring to the comparative ability  
5 of those two waste streams to  
6 mobilize say metals that are in other  
7 wastes at the site or in soils at the  
8 site?

9 So if you have two waste  
10 streams, one is pure sulfuric acid,  
11 the other waste stream is sulfuric  
12 acid with some dissolved metals in it  
13 and both of those waste streams are  
14 disposed of at the site, how would  
15 those two waste streams differ in how  
16 they mobilize --

17 BY MR. PETTIT:

18 Q. The metals already existing  
19 at the site.

20 A. Okay. They wouldn't have  
21 any substantial difference in their  
22 impact. It would really be the  
23 acidic nature of the bulk waste  
24 rather than any metals that happen to



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1 be already dissolved in the waste.

2 Q. Okay. Now, of the very few  
3 exceptions to your statement that  
4 metals are mobilized by acidic  
5 conditions, are any of those  
6 exceptions present at the Boarhead  
7 site?

8 A. I don't have any  
9 information that they are, no.

10 Q. Would arsenic be one of  
11 those exceptions?

12 A. Arsenic is a compound that  
13 has very complex chemistry, and it's  
14 possible that there could be  
15 situations where it would be less  
16 mobile in acidic solution, yes.

17 Q. How about beryllium?

18 A. I'm not familiar with  
19 how -- I'm not familiar with  
20 situations where beryllium could be  
21 less mobile in an acidic solution.

22 Q. How about cadmium?

23 A. I would say that cadmium  
24 would always be mobile in an acidic



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1 solution.

2 Q. How about lead?

3 A. The same.

4 Q. Nickel?

5 A. It's the same.

6 Q. And zinc?

7 A. The same.

8 Q. How about chromium?

9 A. Chromium's chemistry is a  
10 little bit more complex, probably not  
11 as complex as arsenic.

12 But again you could  
13 probably find situations where given  
14 other characteristics of the  
15 groundwater or soil that chromium in  
16 certain states could be less mobile  
17 in an acidic solution.

18 Q. And am I correct that at  
19 Boarhead the form of chromium called  
20 hexavalent chromium was addressed by  
21 the remedy and not the other form?

22 A. I don't recall exactly how  
23 that broke down, but I would assume  
24 that the majority of the issues at



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1 the site were related to chromium VI,  
2 hexavalent chromium.

3 Q. And is hexavalent chromium  
4 or chromium VI, is that more soluble  
5 in acidic solutions?

6 A. I would say in general,  
7 yes. But, again, chromium chemistry  
8 is very complex.

9 Q. Also in the sentence you  
10 use the term the "acidity of these  
11 wastes." How do you measure acidity?

12 A. By pH.

13 Q. Am I correct that when that  
14 is measured in a Superfund site  
15 that's a scale of 0 to 10?

16 A. Well, in general it's a  
17 scale of 0 to 14.

18 Q. 14, okay. But is there  
19 ever a negative pH measured Superfund  
20 site?

21 MR. HARRIS: Objection to  
22 the form.

23 THE WITNESS: I certainly  
24 hope not.



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1 BY MR. PETTIT:

2 Q. Is it possible to do so,  
3 given the nature of the testing or  
4 the practices that are followed?

5 A. No. Because what pH stands  
6 for is the hydrogen ion  
7 concentration, so you wouldn't have a  
8 negative hydrogen ion concentration,  
9 so it should only be a positive  
10 number. It can be pretty low, but it  
11 should only be a positive number.

12 Q. Is there any data at the  
13 Boarhead site of measurement of pH in  
14 the groundwater other than the  
15 monitoring wells that were installed?

16 A. Not that I'm aware of, no.

17 Q. On the top of Page 14 you  
18 are talking about the corrosive waste  
19 solutions that did not contain  
20 metals, and you use the phrase  
21 altered the subsurface environment in  
22 ways that increased mobility  
23 persistence of the hazardous  
24 chemicals.



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 In what ways did, in your  
2 opinion, would those kinds of wastes  
3 alter the subsurface environment?

4 A. Can you just tell me where  
5 you are reading from exactly?

6 Q. The last word on the bottom  
7 of 13.

8 A. Okay. And I think we  
9 touched on this a little bit  
10 earlier. If you have an acidic  
11 solution that is disposed of at the  
12 site, it could, for example -- it  
13 could degrade or mobilize the organic  
14 carbon in the soil.

15 That reduction in organic  
16 carbon content in the soil will in  
17 turn affect how organic compounds  
18 such as trichloroethylene behave in  
19 the soil.

20 So you could have a  
21 situation where if you didn't have  
22 the corrosive waste, the  
23 trichloroethylene may be bound up in  
24 the organic carbon in the soil.



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 But because that subsurface  
2 environment was altered because of  
3 the corrosive wastes, there's no  
4 longer as much organic carbon content  
5 and therefore the trichloroethylene  
6 is a lot more mobile in the  
7 subsurface.

8 Q. Okay. In any other ways do  
9 you believe that those wastes altered  
10 the subsurface environment?

11 A. Well, sure, there's other  
12 ways.

13 Again, it could dissolve  
14 the outer coating of soil particles,  
15 the outer coating where you have a  
16 lot of oxygen or hydroxide compounds  
17 that if they hadn't been exposed to  
18 that acidic waste would have helped  
19 adsorb or absorb contaminants.

20 But because the soil  
21 particles have been stripped of that  
22 outer coating, contaminants will  
23 generally flow a lot more freely in  
24 the subsurface.



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 Q. Is that generally what's  
2 referred to as buffering capacity or  
3 is that something different?

4 A. It's similar. It's not  
5 exactly that, but it's a similar  
6 concept to buffering capacity. You  
7 could have materials in the soil that  
8 tend to buffer acid solutions or  
9 corrosive solutions.

10 So if you spill a low pH  
11 material and if you have a high pH  
12 material in the soil, that will tend  
13 to buffer it.

14 The more acidic solution  
15 you spill you deplete that buffering  
16 capacity and therefore the soil loses  
17 its capacity to retain contaminants.

18 Q. Okay. Any other ways that  
19 these wastes alter the subsurface  
20 environment?

21 A. I would say that they would  
22 also alter the subsurface environment  
23 in a physical way too. Not  
24 dissimilar to if you spilled sulfuric



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 acid on that stack of paper, it's  
2 going to eat a hole in the paper.

3 These corrosive liquids  
4 will increase the permeability of the  
5 soil, they will create holes in the  
6 soil.

7 Therefore wastes that are  
8 there already or wastes that may be  
9 disposed of will migrate a lot freer  
10 because the permeability of the soil  
11 is a lot greater.

12 Q. Am I right that all those  
13 things that you have mentioned  
14 increase the mobility of metals in  
15 the soil and other substances?

16 A. And other substances, yes.

17 Q. Now, you also used the term  
18 "persistence of hazardous  
19 chemicals." What did you mean by  
20 that? That's in the same sentence.

21 A. Persistence refers to for  
22 organic compounds you could have  
23 environments that are conducive to  
24 degrading those organic compounds.



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1                   For instance,  
2       trichloroethylene could degrade to  
3       dichloroethylene, vinyl chloride and  
4       then carbon dioxide.

5                   If you release corrosive  
6       materials in the subsurface, the  
7       microorganisms that facilitate that  
8       degradation aren't going to survive,  
9       just like if somebody dumped a vat of  
10      sulfuric acid on you, you are not  
11      going to survive.

12                   It kills living organisms.

13                   And so those living  
14      organisms aren't around to degrade  
15      the trichloroethylene and therefore  
16      the trichloroethylene can be a lot  
17      more persistent.

18                   Q.     The next sentence reads,  
19      "Such solutions may have also  
20      mobilized metals that were naturally  
21      present in the soils at the site."  
22      Is that an opinion you hold to a  
23      reasonable degree of scientific  
24      certainty?



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1 A. Yes.

2 Q. And why do you use the term  
3 "may" there? Is that the equivalent  
4 of reasonable degree of scientific  
5 certainty?

6 A. I guess, again, the only  
7 reason I use "may" there is there was  
8 no specific test that was done at the  
9 site to determine that that's how,  
10 for instance, the high levels of  
11 metals were found in the residential  
12 wells that they were dissolved from  
13 the diabase material because of the  
14 corrosive wastes.

15 There was no specific  
16 evaluation or testing done to  
17 determine that that was the  
18 phenomenon that caused that.

19 Q. What data is there at the  
20 site that relates to that question?

21 A. Well, there's data relating  
22 to the fact that you did have  
23 corrosive materials disposed of at  
24 the site, there's data related to the



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1 fact that you have high levels of  
2 metals throughout the site both in  
3 soils and in groundwater and in  
4 residential wells off site, and  
5 there's data at the site indicating  
6 that there is a geologic formulation,  
7 namely this diabase that has high  
8 concentrations of metals.

9 Q. Is there any other data  
10 that you are aware of that's at the  
11 site that relates to that opinion?

12 A. No.

13 Q. And did you consider all  
14 that data in coming up with this  
15 opinion?

16 A. Yes, I did.

17 Q. Now, is there any data at  
18 the site that indicates that there's  
19 a degradation of organic carbon as a  
20 result of discharge of corrosive  
21 solutions without substantial  
22 quantities of metal?

23 A. Any specific data to show  
24 that?



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1 Q. Yes.

2 A. No.

3 Q. How about the same question  
4 with respect to what you talked  
5 about, dissolving the outer coating  
6 of the soil.

7 A. I don't believe that there  
8 is, no.

9 Q. And how about the effects  
10 on buffering capacity?

11 A. I couldn't say for sure.  
12 There may be data or there may have  
13 been some evaluation done of that  
14 phenomena. I can't say for sure.

15 Q. What kind of evaluation do  
16 you mean?

17 A. It could be an evaluation  
18 that looked at the buffering capacity  
19 of can I say a background soil sample  
20 versus the buffering capacity of the  
21 soils that were found at the site  
22 that had been exposed to these  
23 corrosive wastes.

24 Q. Is there any data on the



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 impact of microorganisms on the site  
2 by the discharge of corrosive waste  
3 solutions?

4 A. I don't know. It occurs to  
5 me that that was mentioned in the RI,  
6 but I could not say for sure.

7 Q. Is there anything in a  
8 historical record at Boarhead that  
9 would address any of those factors,  
10 supply data that one could review to  
11 address those factors?

12 MR. HARRIS: Objection.  
13 Asked and answered.

14 THE WITNESS: Well, you  
15 could -- I guess you could go back  
16 and look at -- it's possible that  
17 they did gather data on the organic  
18 carbon content of the soils.

19 And you can look at that  
20 versus background soil samples or the  
21 organic carbon content of what you  
22 would expect to find in soils such as  
23 are found in upper Bucks County,  
24 Pennsylvania to determine whether or



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1 not the presence of corrosive  
2 materials over the years had rendered  
3 that soil bereft or had rendered that  
4 soil -- or depleted the organic  
5 carbon content of that soil.

6 But, again, that's not what  
7 the EPA was attempting to do. The  
8 EPA was simply attempting to address  
9 the health risks, the immediate  
10 health risks associated with the  
11 site.

12 BY MR. PETTIT:

13 Q. In rendering your opinion,  
14 did you do anything along those  
15 lines, collect that data and analyze  
16 it?

17 A. No. I collected no new  
18 data, no.

19 Q. Okay. Mr. Vandeven, if you  
20 could move to Page 16 of your  
21 report. Looking at the very last  
22 paragraph that starts "once  
23 released."

24 A. Yes.



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 Q. And you use the term  
2 "dependent on the characteristics of  
3 the chemical of interest." What kind  
4 of characteristics were you referring  
5 to?

6 A. Different chemicals have  
7 different physical and chemical  
8 characteristics that determine their  
9 behavior in the environment.

10 Q. So that I don't get you off  
11 on the wrong tangent. Do you include  
12 metals as a chemical of interest in  
13 that sentence?

14 A. Yes.

15 Q. Okay. Let me limit, then,  
16 my question to what characteristics  
17 of metals did you mean when you said  
18 this?

19 A. Well, different metals will  
20 have different characteristics also.  
21 You can have a metal that is  
22 predominantly present as a cation,  
23 it's referred to, which is a metal  
24 that has a plus 2 valence charge.



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## DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1                   You can have metals that  
2                   have a propensity to bind with other  
3                   materials in the subsurface.

4                   You can have metals that  
5                   are more influenced by the oxygen  
6                   content of the subsurface, and that  
7                   determines how mobile or persistent  
8                   they are.

9                   Q.       And then you go on and in  
10                  the same sentence as it goes to the  
11                  next page, 17, you use the term  
12                  "characteristics of the environment  
13                  into which the chemical has been  
14                  released."

15                  With respect to metals,  
16                  again, what characteristics of the  
17                  environment were you referring to?

18                  A.       That would refer to the  
19                  soil properties in the -- say if you  
20                  are talking about the vadose zone or  
21                  the area above the groundwater table,  
22                  it would include, again, the coatings  
23                  that you may have on the soil  
24                  particles, different metals would



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1 adhere to soil particles depending on  
2 what other metals and what other  
3 compounds are on the soil particles.

4 In the groundwater it would  
5 be influenced by the oxygen content  
6 of the groundwater.

7 It could be influenced by  
8 other materials both organic and  
9 inorganic that were in the  
10 groundwater. Many metals combine to  
11 organic material, just like an  
12 organic compound binds to organic  
13 material.

14 Q. Toward the bottom of 17,  
15 about the fifth line from the bottom  
16 you state, "all the acidic waste  
17 increase the concentrations and  
18 mobility of the metals."

19 Is there anything more you  
20 want to add about the mobility of  
21 metals and the effect of acidic  
22 wastes other than what we have  
23 already talked about? I just want to  
24 make sure I have all the bases for



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1 your statement on that.

2 A. I think we have talked  
3 about everything.

4 Q. Explain to me what you mean  
5 by the acidic waste increased the  
6 concentrations of the metals.

7 A. Well, what I'm referring to  
8 there is would increase the  
9 concentration in the groundwater. If  
10 it mobilizes the metals, it will then  
11 increase the concentrations of the  
12 metals in the groundwater.

13 Q. All right. When you talk  
14 about mobility of metals as affected  
15 by the acidic waste, are you  
16 referring to the acidity of the waste  
17 itself or the acidity of the soil and  
18 medium, be it groundwater, saturated  
19 zone soil?

20 MR. HARRIS: Objection to  
21 the form.

22 THE WITNESS: It could be  
23 both. It could be metals that may  
24 have come in contact with the bulk



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1       acidic waste.

2                       It could be metals that  
3       have come in contact with groundwater  
4       that's been acidified because of the  
5       acidic waste. So I would say it  
6       could be both.

7                       MR. PETTIT: This might be  
8       a good place to stop. I have another  
9       area I'm going to move onto, but I  
10      can keep going.

11                      MR. HARRIS: Well, again, I  
12      just want to make sure we're done  
13      tomorrow.

14                      MS. FLAX: Off the record.

15                      (Discussion off the  
16      record.)

17                      (Thereupon, at 3:41 p.m.  
18      the deposition adjourned.)



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DEPOSITION OF JAY VANDEVEN, VOLUME I, 2/13/07

1 WITNESS CERTIFICATION

2  
3  
4 I hereby certify that I  
5 have read the foregoing transcript of  
6 my deposition testimony, and that my  
7 answers to the questions propounded,  
8 with the attached corrections or  
9 changes, if any, are true and  
10 correct.  
11  
12  
13  
14

15 DATE----- JAY VANDEVEN-----  
16  
17  
18  
19

20 PRINTED NAME-----  
21  
22  
23  
24



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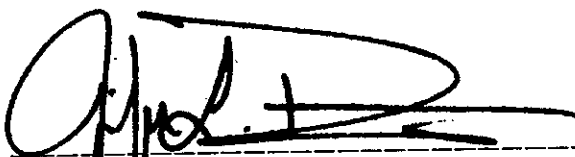
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CERTIFICATION

I, JENNIFER L. BERMUDEZ, a Court Reporter in and for the Commonwealth of Pennsylvania, hereby certify that the foregoing is a true and accurate transcript of the deposition of said witness who was first duly sworn by me on the date and place hereinbefore set forth.

I FURTHER CERTIFY that I am neither attorney nor counsel for, nor related to or employed by, any of the parties to the action in which this deposition was taken, and further that I am not a relative or employee of any attorney or counsel employed in this action, nor am I financially interested in this case.



JENNIFER L. BERMUDEZ

Court Reporter and Notary Public

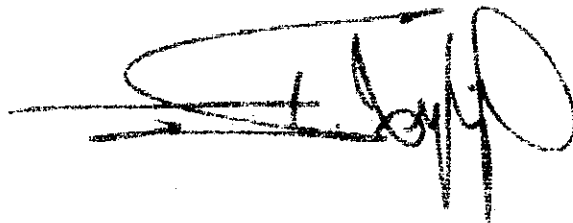


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A handwritten signature in black ink, appearing to be "St. John" or similar, written in a cursive style. The signature is located in the lower right quadrant of the page.